Energy and the Environment for an Expeditionary Army

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Leadership Supports Army Initiatives

“…we will invest $15 billion a year to develop technologies like wind power and solar power; advanced biofuels….”
2/24/09

“We're making our government's largest ever investment in renewable energy – an investment aimed at doubling the generating capacity from wind and other renewable[s]… “
9/23/09

-Presid

“By investing in groundbreaking research, making homes and businesses more energy efficient and deploying solar, wind, biomass and other clean energy…will help ensure that America once again leads the world in confronting our global economic, energy and climate challenges.”

-Dr. Steven Chu, Secretary of Energy

National Energy Awareness Month

- The October 2009 National Energy Awareness Month theme is “A Sustainable Energy Future: We’re putting all the pieces together.”

- The Army is uniquely positioned to lead by example, strategically deploy advanced technologies, and increase the use of renewable and alternative energy sources.

- The Army Energy Security Implementation Strategy articulates the Army’s vision, mission, and goals for achieving greater energy security and ensuring energy is a key consideration in all decision-making, while fostering a culture of awareness and accountability.

- The Army, private sector, and the public have a role in shaping our energy future and moving our nation toward energy independence.

Key Energy & Sustainability Messages

- **Energy Security and Sustainability are inextricably and synergistically linked.**
- The Army views sustainability as a national security imperative in a world where increasing demand for a declining supply of resources, climate change and natural disasters create friction, tensions, population movements and pandemics. The Army is leading the Department of Defense and the federal government in sustainability, stewardship of environmental resources and in initiatives to achieve energy security.
- As an organizing principle, sustainability establishes enabling capabilities that directly support the Army's four major imperatives: sustain, prepare, reset and transform
- From an environmental standpoint, sustainability supports the mission by focusing on the 'Triple Bottom Line-Plus' of Mission, Environment and Community, plus the economic benefits that result from a successful application across a large scale.

Key Energy & Sustainability Messages

- Energy Security includes surety (preventing loss of access), supply (accessing local alternative and renewable energy sources), sufficiency (adequate quantities when needed), survivability (resilient systems), and sustainability (promoting support for the Army's mission, community, and environment).
- The Army's efforts are self-initiated and leverage all of its successes in energy security and environmental stewardship to ensure the greatest return on its investments and progress toward a sustainable future.
- **Energy Security is an Operational Imperative and a top Army Priority**. Energy dependence creates a logistical tail which slows operations and makes deployed forces more vulnerable. Army bases and Soldier training require secure and uninterrupted access to energy. The Army has adopted a comprehensive energy security strategy, and is investing more than $1 billion in energy security initiatives, including nearly $700 million in Army energy stimulus funds. Army energy consumption has been reduced by some 30% per square foot since 1985.
- Success will **require Public-Private Partnerships with Industry**. Industry expertise and financing are integral to the success of energy security and sustainability campaigns.

ARMY ENERGY SECURITY IMPLEMENTATION STRATEGY

Legislation

- EPAct 2005
- EISA 2007
- NDAA 2007

Executive Order

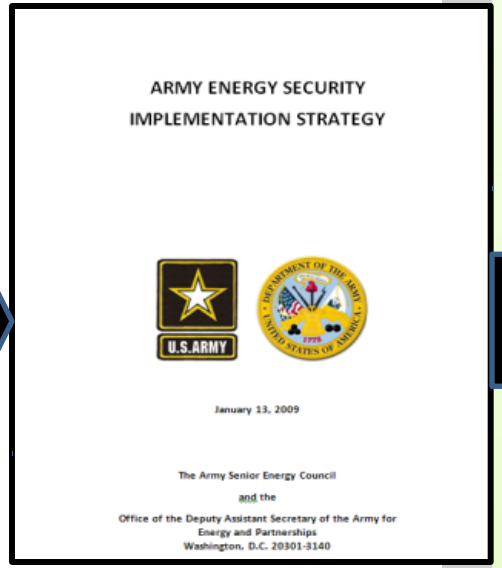
- EO 13423

OSD Policy

- DODI 4170.11, DOD Managers Handbook

Army Policy

- Army Regulation 420-1
- Army Energy & Water Campaign Plan



SURETY

SUPPLY

SUFFICIENCY

SURVIVABILITY

Energy Security Goals (ESGs)

1. Reduce Energy Consumption
2. Increase Energy Efficiency Across Platforms and Facilities
3. Increase Use of Renewable / Alternative Energy
4. Assure Access to Sufficient Energy Supplies
5. Reduce Adverse Impacts on the Environment

U.S. Army Sustainability

Implementation of Sustainability

Policy

- Army Green Procurement Guide
- Sustainable Range Program
- Green Building Requirement
- Executive Order 134
- Endangered Species Act
- Clean Water Act
- Clean Air Act
- Historic Preservation Act

Installation

- Installation Sustainability Plan
- Army Compatible Use Buffer Program
- Integrated Training Area Management
- Energy Security Projects
- Community Engagement
- Products and Materials
- Air Quality Management

Army Triple Bottom Line - Plus

Example Directives and Metrics

Directive Topic	Energy Performance Target [Source]
Installations energy use	Reduce by 30% by 2015 from 2003 baseline [EO 13423 / EISA 2007]
Non-tactical vehicle (NTV) fuel consumption	Reduce 2% per year through 2015, 20% by 2015 [EO 13423]
Electricity from renewable sources	A “Sense of Congress” goal - 25% by 2025 [EISA 2007 / NDAA 2007]
Fossil fuel use in new/renovated buildings	Reduce 55% by 2010; 100% by 2030 [EISA 2007]
Hot water in new/renovated buildings from solar power	30% by 2015 if life cycle cost-effective [EISA 2007]
Non-petroleum fueled vehicles use (ethanol, natural gas)	Increase by 10% annually [EO 13423]
Energy metering for improved energy management	Meter electricity by Oct 2012 [EPAct 2005] Meter natural gas and steam by Oct 2016 [EISA 2007]

Major Army Initiatives

“The Army is Building Green, Buying Green, Going Green”

We are **BUILDING GREEN** by investing over $50B in green buildings, saving the Army an estimated 30% in energy consumption, water consumption and operations costs in the next 5 years.

We are **BUYING GREEN** to reduce the total life-cycle costs of products through the purchase of recyclable or reusable items and increasing savings through the purchase of more energy efficient equipment and appliances.

We are **GOING GREEN** by implementing a multitude of renewable energy programs to address global climate change and reduction in green house gases while maximizing emerging opportunities to apply hybrid technologies in our vehicles for use at home and abroad.

… using sustainability tenets to support energy security ….

Major Army Initiatives

Implement Energy Savings Performance Contract (ESPC) at Fort Leavenworth, KS

- Help meet energy consumption reduction directive of 30% by 2015
- ESPC Contractor paid from actual installation cost savings

Acquisition of Electric / Hybrid vehicles

- Army Order of 502 hybrid vehicles
- Acquisition of 4000 Low Speed Electric Vehicles (LSEV)
- Largest Federal Electric & Hybrid fleets

Major Army Initiatives

Establish Biomass Waste-to-fuel Technology Demonstrations

- Potential to turn five tons of cellulosic waste per month into diesel or jet fuel
- Reduce landfill waste and petroleum purchases
- Partnership with Defense Energy Support Center (DESC)

Build 30 MW Geothermal Power Plant at Hawthorne Army Depot, NV

- Meet all of Hawthorne's electrical power requirements
- Releases essentially no greenhouse gas emissions
- Available 24/7
- Partnership with Navy and USACE

Develop 500 MW Solar Thermal Energy Plant at Fort Irwin, CA

- Supports Energy Security for the Installation
- Estimated $20.8M utility cost reduction to Army over 25 years
- Partnership with Industry through Enhanced Use Lease (EUL) and Power Purchase Agreement (PPA)
- Developer Announced July 09

AMERICAN RECOVERY & REINVESTMENT ACT PROJECTS

- Energy Conservation Investment Program (ECIP)
  - 17 Projects; 13 Installations
  - $32M
- Sustainment, Restoration, And Modernization (SRM)
  - 280+ Projects
  - $365M; $222M NGB
- Research, Development, Test and Evaluation (RDT&E)
  - $75M
    - Advanced Power Electronics Ground Systems Testbed
    - High Temperature Silicon Carbide Semiconductors
    - Ultra Low Energy Community Systems
    - Energy Security Audit & Islanding Methodology
    - Lightweight, Flexible, Cost Effective Solar Energy Photovoltaics
    - Smaller, Lighter Cogeneration and Absorption Environmental

Deployed Operations – “Beans, Bullets and BTUs”

The Challenge

- Fuel logistics, management and protection are key for contingency operations

Key Energy Opportunities

- Distributed Generation
- Tactical Grid Management
- Renewable/Alternative Power
- Lightweight, Flexible, Structural,

  or Integrated Solar
  - Alternative Fuels
  - Standardized Deployable Kits
  - High Efficiency Systems
  - Leveraging Local

… Building green, Buying green, Going green…

EXAMPLE

2007 Kuwait/OIF/OEF Fuel to FOB (M gal)… 431

Fuel trucks needed…… 140,075

Convoys needed…… …..9,332

Soldiers per convoy trip (Fuel trucks, protection, other support)…….120

Soldier trips…… ….644,360

Fewer Soldier trips……

Conclusion

a new energy for America's expeditionary Army

- The ***Army is answering and leading*** the call to the nation "to face one of the great challenges of our time: confronting our dependence on foreign oil, addressing the moral, economic, and environmental challenge of global climate change, and building a clean energy future that benefits all Americans."

- ***Leveraging the inter-agency process*** to lead in the transformation of the ways we produce and use energy for the sake of our environment, our economy, and our security.

- Continue to ***lead by example in using public and private cooperation*** to meet our nation's security needs.

….but wait, there's more!

y Energy Research, Development and Engineering: Beyond Installation
r. Grace M. Bochenek

Bliss Energy Program
G Howard B. Bromberg

rgy Security
G Robert Van Antwerp

king a Case for an Energy Security Strategy in an Energy-Climate Chang
. Brian J. Lally

rgy & Environment for an Expeditionary Army
Al Aycock

ANY QUESTIONS?

★ARMY GREEN★

ARMY STRONG

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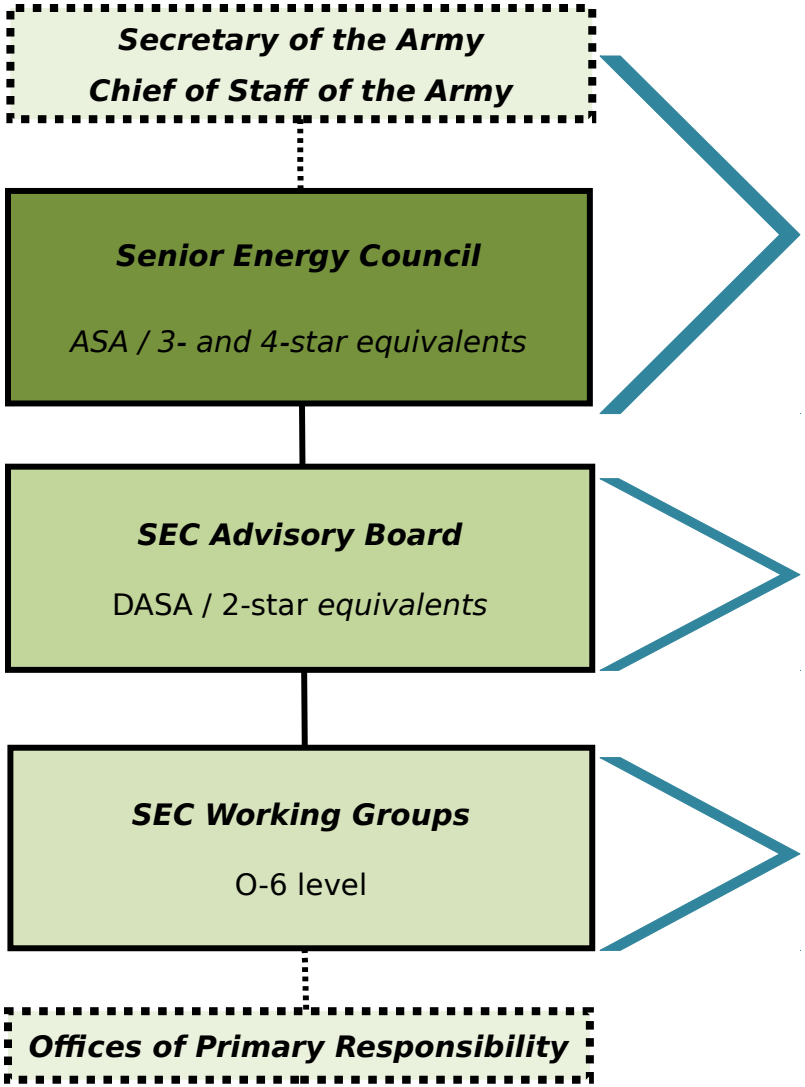
BACK UP SLIDES

Army Senior Energy Council (SEC)

Provides enterprise leadership, strategy and accountability for energy security



Co-Chairs –
Vice Chief of Staff of the Army
Asst Sec of the Army (Installations and Environment)

Executive Secretary / Senior Energy Executive –
Dep Asst Sec of the Army (Energy and Partnerships), DASA(E&P)

Members –
Army organizations, and HQ staff

Chair –
DASA(E&P)

Members –
SEC principal offices

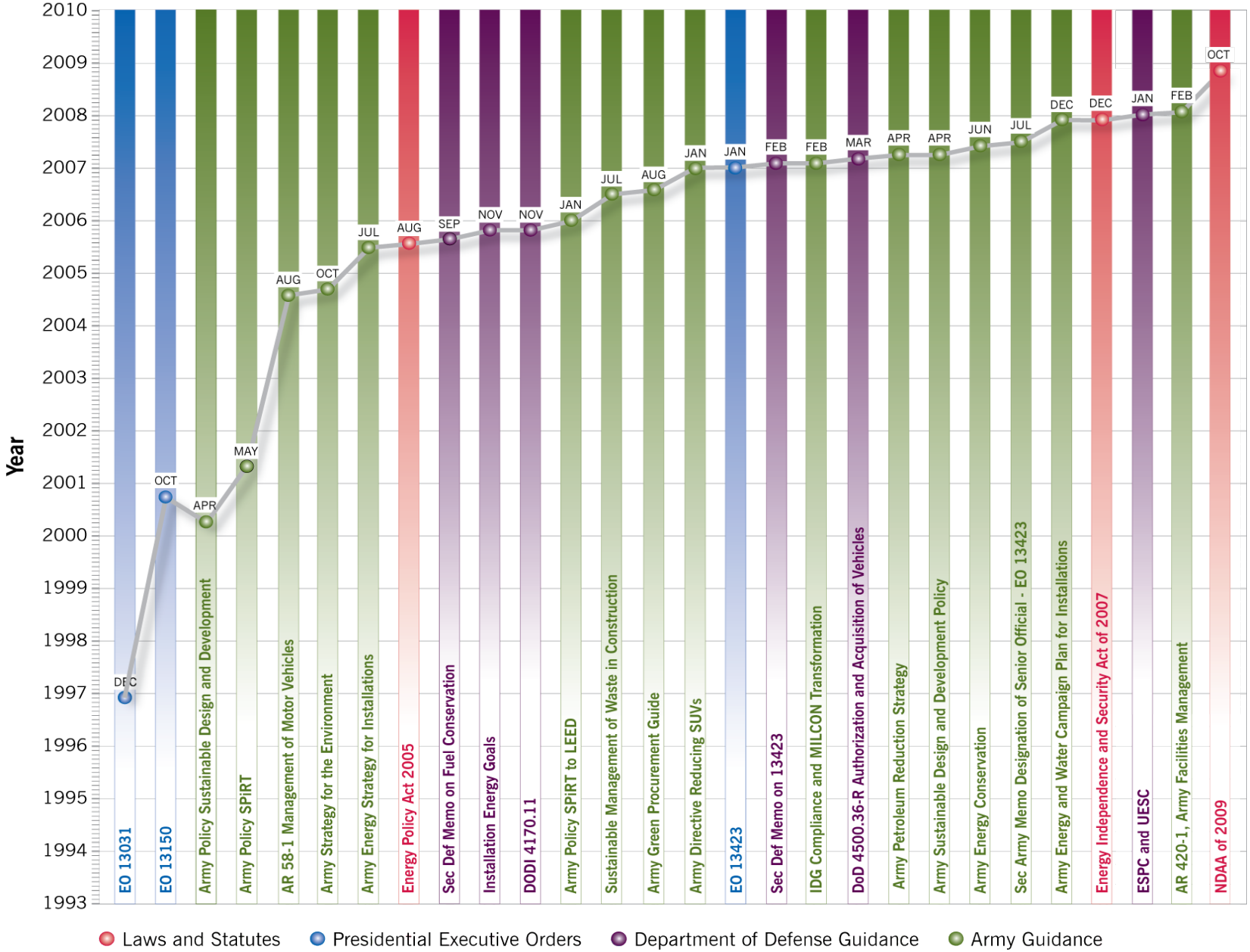
Members –
Reflects all SEC organizations

Coordinates with offices across the Army to implement the Army energy security strategy

SEC

VCSA – co-chair	
ASA(I&E) – co-chair	
DUSA	G-1
DAS	G-2
SMA	G-3/5/7
AMC	G-4
AASA	G-8
ACSIM	G-8, PAE
ASA(ALT)	OCAR
ASA(CW)	OCLL
ASA(FM&C)	OCPA
ASA(I&E)	OGC
ASA(M&RA)	OTJAG
CIO/ G-6	TRADOC
DARNG	FORSCOM
USACE	MEDCOM
	ATEC

Key Energy Directives



Army Sustainability Campaign Plan

Concept of Operations – Operational Design